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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,911	09/29/2003	Avinash S. Patwardhan	166538007US	2085

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EXAMINER	
JACOB, MARY C	
ART UNIT	PAPER NUMBER
2123	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/675,911	PATWARDHAN ET AL.	
	Examiner	Art Unit	
	Mary C. Jacob	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-20 and 22-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-20, 22-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 November 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims have been presented for examination.

2. The response filed on 11/15/06 has been received and considered. Claims 1, 3-20, 22-29 are presented for examination.

Drawings

3. The objections to the drawings are hereby withdrawn in light of the corrections to the drawings, filed 11/15/06.

Specification

4. The objections to the specification are hereby withdrawn in light of the amendments to the specification, filed 11/15/06.

Claim Objections

5. The objections to the claims are hereby withdrawn in light of the amendments to the claims, filed 11/15/06.

Claim Rejections - 35 USC § 112

6. The rejections of claims 1-26 under the second paragraph of 35 U.S.C. 112 are hereby withdrawn in light of the amendments to the claims, filed 11/15/06.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1, 5, 7, 9-12, 16, 19, 20, 22, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitjema ("Modeling Lake-Groundwater Interactions in GFLOW 2000", March 4, 2002) in view of Deal et al ("Ecological Sustainability and Urban Dynamics: A Disaggregated Modeling Approach to Sustainable Design", 7th International Conference on Computers in Urban Planning and Urban Management, Honolulu, HI, 2001).

9. As to Claims 1, 16, and 26, Haitjema teaches the simulation of inflow and outflow from a lake wherein objects representing sources of water calculate the outflow and inflow of water to a lake based on the inflow and outflow from sources of water and the attributes of the source of water (page 4 of 15, "Defining Inlet and Outlet Streams"; page

6 of 15, first paragraph; page 7 of 15, "Finally, calculate the total flow...and that precipitation and evapotranspiration are combined into the net recharge rate that the lake receives."); generating a graphical representation of flow of water dependencies between the lake and sources of water, the dependencies indicating an outflow from a source of water to an inflow to the lake (page 4 of 15, "Defining Inlet and Outlet Streams"; page 6 of 15, first paragraph); receiving attributes describing the lake and the sources of water (page 4 of 15, "Defining Inlet and Outlet Streams"; page 6 of 15, first paragraph; page 7 of 15, "After these inspections...and that precipitation and evapotranspiration are combined into the net recharge rate that the lake receives."); and performing a simulation for a plurality of time increments to calculate the outflow from the lake for those time increments (page 7 of 15, last paragraph-page 8 of 15, first 2 sentences; pages 11, 12 and 13 of 15, "Solution Strategies and Lake Water Balance").

10. Haitjema does not expressly teach objects representing areas of land use for calculating the outflow of water for an area based on the inflow of water and attributes of the object being areas of land use, wherein each area is a type of pervious area or a type of impervious area.

11. Deal et al teaches the Land Use Evolution and Impact Assessment model (LEAM), a collaborative and disaggregated approach to modeling the urban environment that that allows researchers and planning professionals to address urban dynamics in greater detail at a greater variety of scales and interfaces. Deal et al teaches objects representing areas of land use for calculating the influence of the areas of land use on a watershed based on the inflow of water and attributes of the object

(page 12 of 25, "Model drivers represent the dynamic interactions between the urban system and the surrounding landscape."; pages 15 and 16 of 25, "Application" and "Model Results"), wherein each area is a type of pervious area or a type of impervious area (page 16 of 25, "Existing Land Use" and explanation of Figure 6).

12. Haitjema and Deal et al are analogous art since they are both directed to the modeling of hydrological properties and the interaction between different components of a landscape.

13. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the simulation of inflow and outflow from a lake as taught by Haitjema to include the objects representing areas of land use for calculating the influence of the areas of land use on a watershed based on the inflow of water and attributes of the object, wherein each area is a type of pervious area or a type of impervious area as taught by Deal et al since Deal et al teaches the Land Use Evolution and Impact Assessment model (LEAM), a collaborative and disaggregated approach to modeling the urban environment that that allows researchers and planning professionals to address urban dynamics in greater detail at a greater variety of scales and interfaces.

14. As to Claims 12, 22 and 23, Haitjema and Deal et al teach: wherein an area represents multiple occurrences of similar areas, wherein an impervious area is a road, and wherein an impervious area is a roof (Deal: page 16 of 25, "Existing Land Use" and explanation of Figure 6), where the residential and commercial properties have roofs.

15. As to Claims 5 and 19, Haitjema and Deal et al teach: wherein the attributes of a source of water include periodic rainfall amounts (Haitjema: page 8 of 15, "Line-sink Lakes, sentence 4).

16. As to Claim 7, Haitjema and Deal et al teach: wherein outflow includes evapotranspiration (Haitjema, page 8 of 15, "Line-sink Lakes, sentence 4).

17. As to Claim 9, Haitjema and Deal et al teach: wherein outflow includes interflow (Haitjema: page 6 of 15, paragraph 1; page 7 of 15, "After these inspections...the net recharge rate that the lake receives").

18. As to Claim 10, Haitjema and Deal et al teach: wherein outflow includes groundwater flow (Haitjema: page 2 of 15, "High-k Lakes", paragraph 1; page 7 of 15, "After the DOS box closes you can click on the flux inspection line and read on the status bar the total groundwater flow into or out of the lake").

19. As to Claims 20 and 11, Haitjema and Deal et al teach: receiving constraints, receiving an objective function and repeatedly performing the simulation varying parameters based on user provided constraints to optimize an objective function (Haitjema: page 7 of 15, last paragraph-page 8 of 15, first 2 sentences; pages 11, 12 and 13 of 15, "Solution Strategies and Lake Water Balance").

20. Claims 3, 13, 14, 17, 24, 25, 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitjema and Deal et al as applied to claims 1, 16 and 26 above, and further in view of Muller ("Advanced Drawing Tools Aid Network Planning", International Journal of Network Management, Vol. 7, pages 324-333, 1997).

21. Haitjema and Deal et al teach wherein the generating of the graphical representation includes: interconnecting elements in the design representing dependencies (Haitjema: page 4 of 15, "Defining Inlet and Outlet Streams", sentence 1) and the use of icon based modeling techniques to create models representing sources of water and the flows between them (Deal: page 6 of 25, paragraph 3, "Such an alternative..."; page 12 of 25, first paragraph, "Using iconic..."), rainfall, imperviousness (Deal: page 15 of 25, paragraph 3, sentence 3, "The model also evaluates...") and evapotranspiration (Haitjema, page 8 of 15, "Line-sink Lakes, sentence 4) factors.

22. Haitjema and Deal et al do not expressly teach user instructions on the placement and interconnection of icons, dragging and dropping icons, the icons representing areas, rainfall, evapotranspiration, impervious areas and pervious areas, wherein multiple outflows can be combined into a single outflow, and wherein an outflow can be divided into multiple outflows.

23. Muller teaches the Visio Technical drawing tool that employs easy to use and learn graphics capabilities that provides a high degree of intelligence and programmability to the designer through simplified graphical representations of complex projects, thereby enabling more people to understand and participate in the planning process (Conclusion) wherein the user can (claims 27, 28) drag and drop iconic shapes into a drawing space and (claims 3, 13, 14, 17, 29) connect them together using a stencil tool or connector tool (page 327, column 1, paragraph 2 and 3, "The user adds...") wherein it is understood that the user can define multiple outflows into a single outflow and dividing an outflow into a multiple outflow; and (claims 24, 25, 28) wherein

the shapes themselves are programmable so they can behave like the objects they represent (page 325, paragraph 2, sentence 1,"The Visio shapes..."), therefore, they can be programmed to represent rainfall, evapotranspiration, sources of water, areas of land use, impervious areas and pervious areas.

24. Haitjema and Deal et al and Muller are analogous art since they are both directed to iconic modeling.

25. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the iconic based modeling and interconnecting as taught in Haitjema and Deal et al to include user instructions on the placement and interconnection of icons, dragging and dropping icons, the icons representing areas, rainfall and evapotranspiration, combining multiple outflows into a single outflow, and dividing an outflow multiple outflows as taught by Muller since Muller teaches the Visio Technical drawing tool that employs easy to use and learn graphics capabilities that provides a high degree of intelligence and programmability to the designer through simplified graphical representations of complex projects, thereby enabling more people to understand and participate in the planning process (Conclusion).

26. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitjema and Deal et al as applied to claim 1 above, and further in view of Liaw et al ("Low-Impact Development: An Innovative Alternative Approach to Stormwater Management", Journal of Marine Science and Technology, Vol. 8, No. 1, pp. 41-49, 2000).

27. Haitjema and Deal et al teach the simulation of inflow and outflow of water through a landscape wherein objects representing sources of water and areas calculate the outflow and inflow of water through a landscape including water sources and areas of use based on the inflow and outflow from sources of water and areas.

28. Haitjema and Deal et al do not expressly teach wherein outflow includes runoff and infiltration.

29. Liaw et al teaches Low Impact Development (LID), a cost effective alternative approach to stormwater management and the protection of natural resources that provides tangible economic incentives to a developer to save more natural areas and reduce stormwater and roadway infrastructure costs (Conclusions and Summary, paragraph 1), wherein steps are taken to minimize runoff and to increase infiltration (pages 2 and 3 of 12, "LID Basic Site Planning Strategies"), two examples of outflow.

30. Haitjema and Deal et al and Liaw et al are analogous art since they are both directed to the modeling and simulation of water flow in an urban development.

31. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the simulation of inflow and outflow from a landscape including water sources and areas of use as taught by Haitjema and Deal et al to include outflow such as runoff and infiltration as taught by Liaw et al since Liaw et al teaches Low Impact Development (LID), a cost effective alternative approach to stormwater management and the protection of natural resources that provides tangible economic incentives to a developer to save more natural areas and reduce stormwater and roadway infrastructure costs (Conclusions and Summary, paragraph 1).

32. Claims 4, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitjema and Deal et al as applied to claim 1 above, and further in view of Gaillard et al ("Modelling of Human Dimension on Soil Erosion Processes for Remote Sensing Applications", IEEE International Symposium on Geoscience and Remote Sensing, IGARSS '97, Vol. 1, pages 122-124, 1997).

33. Haitjema and Deal et al teach the simulation of inflow and outflow of water through a landscape including water sources and areas of use wherein objects representing sources of water and areas calculate the outflow and inflow of water through a landscape including water sources and areas of use based on the inflow and outflow from sources of water and areas.

34. Haitjema and Deal et al do not expressly teach wherein objects representing an area also calculate sediment amounts, wherein the attributes describing an area include size of the area.

35. Gaillard et al teaches improvements on the distribution of water and sedimentation flows in a hydrological and erosion model in order to allow a better assessment of the human impact on soil erosion processes (Page 122, column 2, paragraph 2, "In order to allow...") wherein sediment transfers are accounted for (page 122, "Watershed Erosion Simulation", paragraphs 1 and 2) and wherein the size and orientation of plots influence the erosion process (Introduction, paragraph 1).

36. Haitjema and Deal et al and Gaillard et al are analogous art since they are both directed to simulating the flow of water through a landscape development.

37. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the simulation of inflow and outflow through a landscape including water sources and areas of use as taught by Haitjema and Deal et al to further include objects representing an area that calculate sediment amounts and attributes describing an area that include size of the area as taught by Gaillard et al since Gaillard et al teaches improvements on the distribution of water and sedimentation flows in a hydrological and erosion model in order to allow a better assessment of the human impact on soil erosion processes (Page 122, column 2, paragraph 2, "In order to allow...") and since the size of a plot influences the erosion process (Introduction, paragraph 1).

Response to Arguments

38. Applicant's arguments filed 11/15/06 have been fully considered but they are not persuasive.

39. Applicants respectfully disagree with the teachings of Deal that were relied upon to show the teaching of "objects representing areas of land use for calculating the influence of the areas of land use on a watershed based on the inflow of water and attributes of the object" (pages 12 and 13 of arguments). Deal teaches objects representing areas of land use (page 16 of 25, "Existing Land Use" and Figure 6) wherein the colors represent the different areas of land use wherein the "characteristics" of the land use areas are read from the map and used as input to the model. These graphical representations and "characteristics" of the land use areas are interpreted to

encompass graphical "objects" representing areas of land use with the corresponding "characteristics" of the land use areas being "attributes" of the areas of land use. Further, Deal teaches that the model evaluates, "the influence of land use changes on surface water quality using land use imperviousness factors and average annual rainfall events" (page 15 of 25, "Application", second paragraph). This evaluation of areas of land uses on water quality due to these imperviousness factors and rainfall events are interpreted to encompass "calculating the influence of the areas of land use on a watershed based on the inflow of water" since the rainfall events would be an inflow of water and imperviousness would also impact the inflow of water to a watershed.

40. Applicants argue, "a grid cell of a raster-based GIS map is very different from Applicant's area of land use or an object representing an area of land use". As to this argument, the claims recite an "object representing an area of a land use", and "generating a graphical representation of flow of water dependencies of the areas and the sources of water". Since the claim language is interpreted to recite an "object representing areas of a land use" that is "graphically represented", wherein "object" is not further limited or defined, the graphical representation of the areas of land use by color as taught in Deal (Figure 6) are concluded to encompass "objects" graphically representing these areas of land use.

41. Applicants argue, "the Examiner has not pointed to anything in Deal that could possibly correspond to Applicants' graphical representation of flow of water dependencies of areas and sources of water". As to this argument, it is noted that the teachings of Haitjema, which teach a graphical representation of flow of water

dependencies between sources of water, *in view of Deal*, are relied upon to show the teaching of this limitation.

42. Applicants argue, "Deal contains no teaching or suggestion of calculating the outflow of water for an area based on the inflow of water to the area and attributes of the area". As to this argument, is noted that the teachings of Haitjema, which teach calculating the outflow of water for a source of water based on the inflow of water to the source of water, *in view of Deal*, are relied upon to show the teaching of this limitation. Further, it is noted that Deal teaches the impact of land use changes on surface water quality using land use imperviousness factors and rainfall events "page 15 of 25, "Application", paragraph 2). This shows an assessment of the impact that the outflow of water from an area has based on the inflow of water to the area and the attributes of the area that impact the flow of water through the area of land use. It can be concluded from this disclosure that the outflow of water from the area must be calculated in order to evaluate the changes to the surface water quality.

43. Applicants argue, "neither Haitjema, Deal...teaches or suggests the claimed "each area being a type of pervious area or a type of impervious area". However, Deal teaches areas being a type of pervious area or impervious area (page 16 of 25, "Existing Land Use" and explanation of Figure 6), wherein the areas of land use represented in the model include agricultural, residential, commercial, open space, protected agricultural lands, waterways and roads. Residential, commercial and roads were interpreted to encompass "impervious" areas and agricultural and open space areas were interpreted to encompass "pervious" areas.

Conclusion

44. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

45. Eiswirth, Matthias ("Hydrogeological Factors for Sustainable Urban Water Systems", In: Howard K, & Israfilov, R. (eds): Current Problems of Hydrogeology in Urban Areas, Urban Agglomerates and Industrial Centres. Kulwer, Dordecht, pages 159-183, 2001) teaches modeling and simulating the flow of water through an urban hydrogeological setting.

46. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

47. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C. Jacob whose telephone number is 571-272-6249. The examiner can normally be reached on M-F 7AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Mary C. Jacob
Examiner
AU2123

MCJ
1/18/07

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